AMENDMENTS TO THE CLAIMS

1. (original) A nanoscale logic gate comprising:

an alternating-current source;

two or more input signal lines connected through resistive elements to the alternating-current source and carrying direct-current logical states;

a signal line connected to the alternating-current source and two or more input signal lines through a switch element that is either in a high-impedance state or a low-impedance state; and

an output signal line that outputs an AC logical state.

2. (original) The nanoscale logic gate of claim 1 wherein the nanoscale logic gate outputs an AC signal representing a logical NOR of the DC logical states of the two or more input signal lines.

3. (original) The nanoscale logic gate of claim 2 wherein the switch element is a diode-like element that is slightly forward biased and in a high-impedance state when all of the two or more input signal lines are in logical OFF DC states and is otherwise fully forward biased, in a low-impedance state, and passed both AC and DC current to ground.

4. (original) The nanoscale logic gate of claim 1 wherein the nanoscale logic gate outputs an AC signal representing a logical AND of the DC logical states of the two or more input signal lines.

5. (original) The nanoscale logic gate of claim 4 wherein the switch element is a diode-like element that is fully forward biased, in a low-impedance state, and passes DC current to output unless all of the two or more input signal lines are in logical ON DC states.

6. (original) The nanoscale logic gate of claim 1 wherein the nanoscale logic gate outputs an AC signal representing a logical OR of the DC logical states of the two or more input signal lines.

7. (original) The nanoscale logic gate of claim 6 wherein the switch element is a diode-like element that is fully forward biased, in a low-impedance state, and passes a biasing DC current to output only when all of the two or more input signal lines are in logical OFF DC states and otherwise not fully forward biased and in a high-impedance state.

8. (original) The nanoscale logic gate of claim 1 wherein the nanoscale logic gate outputs an AC signal representing a logical NAND of the DC logical states of the two or more input signal lines.

9. (original) The nanoscale logic gate of claim 1 wherein the switch element is a diode-like element that is fully forward biased, in a low-impedance state, and passes a small DC current to ground when all of the two or more input signal lines are in logical ON DC states, and is otherwise slightly forward biased or reverse biased and in a high-impedance state.

10. (original) A naoscale logic circuit employing one or more nanoscale logic gates of claim 1.

11. (original) A mixed nanoscale/microscale logic circuit employing one or more nanoscale logic gates of claim 1.

12. (currently amended) A method for producing, in a nanoscale logic gate, well-separated output logical states representing a logical operation on the logical states of two or more input signal lines having direct-current-based logical states, the method comprising:

        including in the logical gate an alternating-current source;

interconnecting the alternating-current source to the two or more input signal lines through resistor-like elements;

interconnecting the alternating current source to a signal line through a switch element that ~~may be~~ is in either a high impedance or a low impedance state, depending on the direct-current-based logical states of the input signal lines;

and interconnecting an output signal line to the alternating-current source, two or more input signal lines through resistor-like elements, and switch element so that the output signal line carries a logical AC output signal ~~wither~~ close to the alternating-current source or close to 0.

13. (original) The method of claim 12 wherein the nanoscale logic gate outputs an AC signal representing a logical NOR of the DC logical states of the two or more input signal lines.

14. (original) The method of claim 13 wherein the switch element is a diode-like element that is slightly forward biased and in a high-impedance state when all of the two or more input signal lines are in logical OFF DC states and is otherwise fully forward biased, in a low-impedance state, and passed both AC and DC current to ground.

15. (original) The method of claim 12 wherein the nanoscale logic gate outputs an AC signal representing a logical AND of the DC logical states of the two or more input signal lines.

16. (original) The method of claim 15 wherein the switch element is a diode-like element that is fully forward biased, in a low-impedance state, and passes DC current to output unless all of the two or more input signal lines are in logical ON DC states.

17. (original) The method of claim 12 wherein the nanoscale logic gate outputs an AC signal representing a logical OR of the DC logical states of the two or more input signal lines.

18. (original) The method of claim 17 wherein the switch element is a diode-like element that is fully forward biased, in a low-impedance state, and passes a biasing DC current to output only when all of the two or more input signal lines are in logical OFF DC states and otherwise not fully forward biased and in a high-impedance state.

19. (original) The method of claim 12 wherein the nanoscale logic gate outputs an AC signal representing a logical NAND of the DC logical states of the two or more input signal lines.

20. (original) The method of claim 19 wherein the switch element is a diode-like element that is fully forward biased, in a low-impedance state, and passes a small DC current to ground when all of the two or more input signal lines are in logical ON DC states, and is otherwise slightly forward biased or reverse biased and in a high-impedance state.